THE CHROMOSOMES OF THREE AUSTRALIAN DACETINE ANT SPECIES (HYMENOPTERA: FORMICIDAE)

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Although more species of Myrmicinae have been studied cytologically than of any other ant subfamily (Imai, 1966; Hauschteck, 1965), there have been no reports on the chromosomes of dacetines. The tribe Dacetini is a very distinct group whose members are mostly specialized feeders on Collembola and whose evolution has been traced in unusual depth for ants (Brown and Wilson, 1959). The species treated here fall into three Australasian genera.

Pharate pupae (prepupae), male pupae, and embryos were pretreated with colcemid. Aceto-carmine-orcein squash preparations were made from *Epopostruma* and *Orectognathus* material, and an acetic acid dissociation, air drying technique with aceto-lactic orcein staining (Crozier, 1968a) was also used for *Colobostruma* and *Orectognathus*. The criteria used for chromosome classification are those of Levan, Fredga and Sandberg (1964).

The nomenclature followed is that indicated by Brown and Wilson (1959). Identification of the ants was by W. L. Brown, and specimens will be deposited in the Australian National Insect Collection, C. S. I. R. O., Canberra.

Orectognathus clarki (figures 1 & 4)

$2n = 30$

Material from Narbethong, Victoria, and Ferntree Gully State Park, Victoria, showed that the karyotype of this species comprises nine pairs of metacentric to submetacentric and six pairs of subacrocentric and acrocentric chromosomes; thus two chromosome groups are discernible (figure 4).

Epopostruma sp. (figure 2)

$n = 10$, $2n = 20$

Material from 5 miles W. of Hopetoun, Victoria, has a karyotype

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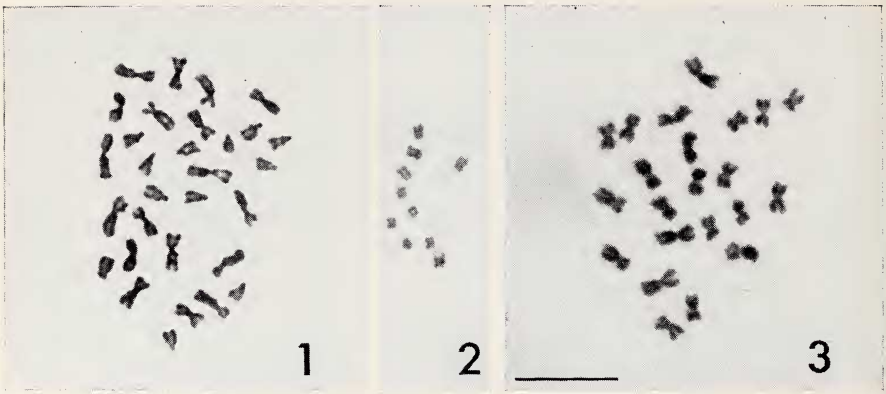

Figures 1-3. Metaphase plates of dacetine species: (1) *Orectognathus clarki,* Ferntree Gully sample. Diploid cell from air dried preparation of pharate pupal cerebral ganglion (2) *Epopostruma* sp. Haploid cell from squash preparation of pupal testis. (3) *Colobostruma alinodis.* Diploid cell from air dried preparation of pharate pupal cerebral ganglion. Line in figure 3 represents 10 microns.

in which all the chromosomes are metacentric, with a more or less continuous gradation in size. A lack of consistent differences precluded grouping the chromosomes.

Colobostruma alinodis (figure 3)

n = 11, 2n = 22

Material from Ferntree Gully State Park, Victoria, shows a karyotype with eleven metacentric chromosomes. As in the case of the *Epopostruma* karyotype above, there is a range in size of the chromosomes, but without consistent discontinuities enabling an arrangement of the chromosomes into groups.

DISCUSSION

In Brown and Wilson's (1959) phylogenetic scheme for the Dacetini, *Colobostruma* and *Epopostruma* are placed very close together, with *Orectognathus* some distance away. The cytogenetic results tend to support this placement although, even between the *Colobostruma* and *Epopostruma* karyotypes, at least three changes must have occurred (one centric fusion or dissociation, and two pericentric inversions). The difference between these karyotypes and that of *Orectognathus clarki* is substantial, and speculation about the changes involved would be idle.

Variation in chromosome number within a genus has now been demonstrated for eight ant genera (*Iridomyrmex, Camponotus, Lasius, Formica, Aphaenogaster, Pheidole, Leptothorax* and *Myrmica* — see references), and it would be surprising in view of the divergence between the karyotypes reported here if such variation were not found in further work on the three dacetine genera. In the case of *Epopostruma* in particular, cytotaxonomy could prove a valuable aid in a genus whose taxonomy is rendered difficult by the tendency of populations to mimic some other locally common ant species (Brown, pers. comm.).

Figure 4. Diploid karyogram of *Orectognathus clarki* from cell in figure 1. Line represents 10 microns.

Interpopulation variation in chromosome morphology is indicated in *Iridomyrmex* of the *"detectus"* group (Crozier, 1968b), and populations of *Rhytidoponera metallica* vary in chromosome number (Crozier, unpub.), indicating that single-sample karyotype analyses in ants can be misleading, even though karyotypic stability does seem the rule in some ant groups. Unfortunately, few dacetine species are common enough to permit repeated sampling.

Ant cytogenetics is still in a survey period, but this should not prevent the gathering of data on intraspecific karyotypic variation in suitable species.

SUMMARY

Two samples of *Orectognathus clarki* showed a haploid chromosome number of 15, comprising 9 metacentric to submetacentric and 6 subacrocentric to acrocentric chromosomes. A sample of *Colobostruma alinodis* had 11 metacentric chromosomes and one of a species of *Epopostruma* 10 metacentric chromosomes, as haploid numbers.

These observations tend to support present taxonomic placement of these genera, but no simple relationship can be demonstrated between any of the genera.

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